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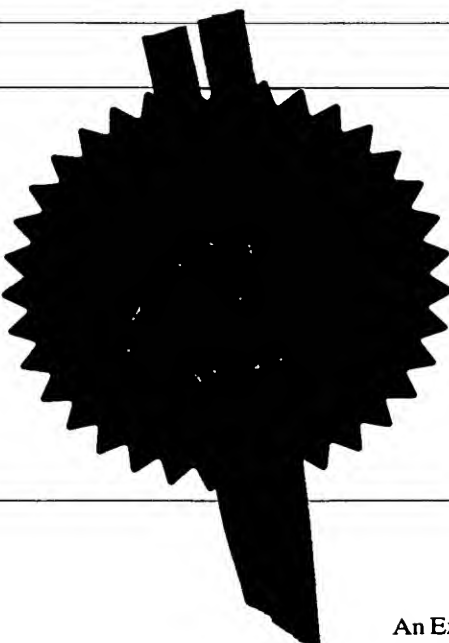
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(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

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3. Full name, address and postcode of the or of each applicant (underline all surnames)

BerlinLondon Ltd
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London EC2A 4AQ

Patents ADP number (if you know it)

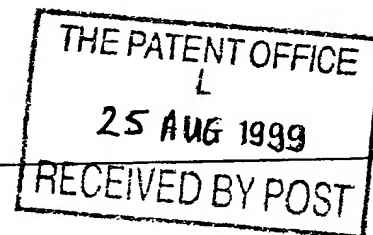
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If the applicant is a corporate body, give the country/state of its incorporation

UNITED KINGDOM

4. Title of the invention

LOCKER



5. Name of your agent (if you have one)

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Country	Priority application number (if you know it)	Date of filing (day / month / year)
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (day / month / year)
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an

applicant, or

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Continuation sheets of this form

Description

Claim(s)

Abstract

Drawing(s)

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Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

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Any other documents (please specify)

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11. I/We request the grant of a patent on the basis of this application.

Signature

Date

Paul Harman 24/8/99

12. Name and daytime telephone number of person to contact in the United Kingdom

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Lockers

5 The present invention relates to lockers, that is, storage cubicles, particularly, though not exclusively, arranged in rows.

10 A known type of locker comprises a cuboid body of five fixed panels which form two side walls, a back wall, a top and a bottom, and a hinged door which, when closed, forms the sixth face of the cuboid. The body and door of the locker are conventionally made out of panels of sheet metal. Such lockers are commonly stacked side-by-side in rows, with the doors all similarly aligned and facing the same direction. Lockers are found in many public or semi-public environments for people to temporarily or indefinitely keep their belongings in. As their name implies, lockers also commonly
15 feature a locking means, typically a lock upon the door which engages with a keep formed in the body of the locker.

20 The door of such a locker is hinged using one or more hinge plates attached to the wall of the locker body and the door, the door being pivoted about its vertical edge. Rather than hinge plates, there may be some other pivoting means between the vertical edge of the door and the locker body, such as upwardly pointing pins set somewhat apart from the wall of the locker, upon which tubular members set upon the door may be rested, such that the tubular members may rotate upon the pins, and so allow the door to
25 pivot.

The hinge of the locker is vulnerable to many types of damage, such as people carelessly over-opening the door, so that the part of the door presses the edge of the side wall of the locker, whereupon the some part of
30 the hinge, or the door or body of the locker itself, may buckle or fail. Another type of strain put upon the locker hinges is caused by people who deliberately wish to cause damage to the locker by hanging upon the door, so that again the hinge or the door may become buckled or broken. The locker is often targeted by thieves, who will apply force upon the key hole,
35 or between the gap between the edges of the door and the locker walls.

The provision of such lockers in confined spaces, especially in narrow corridors, may also give rise to difficulties, as there must be enough space for the doors of the lockers to open whilst still allowing other people
5 past the row of lockers.

The object of the present invention is to provide a locker which is less susceptible to such damage, is easy and efficient to manufacture, and to alleviate other problems of the prior art lockers.
10

According to the present invention there is provided a locker or the like including a body forming a compartment having an open side, and a door supported such that said door may be rotated from a closed position in which the open side of the compartment is substantially covered by the
15 door, to an open position in which the open side of the compartment is substantially uncovered, such that in the open position the door is located substantially alongside the body of the locker. Preferably the door has a curved, generally uniform cross section. Preferably the door has a uniform curvature, and the axis of rotation coincides with the focus of this curve.
20

Preferably the door is supported upon pivot means, which is preferably supplied by one or more generally segmental shapes pivoted about the apex of the segmental shape.

25 Preferably there is included a locking means to secure the door in the closed position. The locking means are preferably of the solenoid type.

According to another aspect of the invention, there is provided a group of lockers according to any previous claim.
30

Preferably there is provided a cavity between the bodies of at least first and second neighbouring lockers capable of accommodating the door of the first locker whilst it is in the closed position. Preferably the cavity, when considered from the front of the lockers, is covered by a covering

member, which preferably includes a recess to accept the one edge of the door of the second locker.

5 When a door having a uniform curvature, that is, a curvature lying upon a circle, is rotated about the centre of that circle, the path swept out by the door will be a curve lying on that same circle. In other words, the curve of the door remains on the circle whilst the door is rotated. A locker having such a door may have an element (such as the column element described below) whose edge is nearly flush with the face of the door, and an edge of
10 the locker's body may be nearly flush with the leading edge (that is to say its edge which leads foremost along the door's curvature as the door is swung open) of the door.

15 A locker and group of lockers embodying the invention will now be described, by way of example, with reference to the drawings of which;

Figure 1 is a plan view of two lockers,

20 Figures 2a and 2b are a side elevation and front elevation respectively of the locker, and

Figure 3 is a plan view of a locker in more detail,

25 Figure 4 is a plan view of another embodiment of a locker and portions of neighbouring lockers.

Referring to figures 1, 2a and 2b, each locker 10 comprises a cuboid body of five fixed planar rectangular surfaces which form two side walls 12,13, a back wall 15, a top 17 and a bottom 18, and curved door 20 of
30 uniform cross section and curvature which is supported upon two hinge segments 25,26 which are pivoted about two pivot points on the body of the locker, an upper pivot point 28 on the locker's top, and a lower 29 on the locker's bottom. Referring to figures 2a and 2b, the top of the locker includes two spaced panels 32,33 and the bottom of the locker includes a
35 panel 35 spaced from a plinth 36 which rests upon the ground. Between the

spaced panels 32,33, and the panel 35 and plinth 36, the upper and lower hinge segments 25,26 are respectively accommodated.

5 The pivot point 28,29 of each hinge segment 25,26 is located at the centre of a circle upon which the door's curve lies. Thus when the door 20 is pivoted about these pivot points, it remains lying upon this circle as it is displaced. The pivot points, hinge segments and door are so arranged upon the body of the locker that the door may be swung between a closed position (as shown in the lower locker in figure 1) where it covers the open side of the locker and an open position where it permits full access to the open side of the locker (as shown in the upper locker in figure 1). The free edges of the side walls 12,13 of the locker (that is, two of the edges bounding the open side of the locker) lie somewhat inside the circle upon which the curve of the door 20 lies, and a chord joining the ends of the curve of the door is somewhat larger than the horizontal width of the open side. The door comes to a stop in its closed position when the side of the excised portion meets a buffer (not shown).

20 In order to open the door may be swung round about the pivot points, so that one edge of the door (that is, one end of the door's curve when considered in plan) comes to rest just before the side wall of the locker. For full access to the locker, the diameter of curvature of the door must be at least $1/\sqrt{2}$ the width of the locker, so that the door is not impeded, when being opened, by the side wall of the locker before the whole of the door has been displaced from in front of the open side of the locker. The diameter of curvature should not be chosen to be any larger than is necessary to allow full access, since the extent to which the door extends perpendicular to the side wall of the locker whilst being swung open should also be kept to a minimum.

30

The hinge segment 25 is a generally segmental shape, having a triangular portion 31 excised from one side. The hinge segment 25, and the weight of the door, are supported by a nylon glider 39 attached to the lower surface of the upper hinge segment 25, and which slides across the lower panel 33 of the two spaced panels which house the hinge segment. The

35

nylon glider could run in a curved groove. The lower hinge segment 26 may be similarly provided with a nylon glider beneath it.

5 The upper and lower hinge segments 25,26 also ensure that the locker compartment is completely enclosed, and for this reason the excised portion 30 of the hinge segment must not be such that it allows any substantial gap between the front edges of the top and bottom 17,18 of the locker on the one hand and the top and bottom edges of the door 20 on the other. Alternatively, the top and bottom of the locker could be shaped so as to include a curved portion to cover these areas.

15 The door also includes a handle 38 set upon the door's outer face (that is, its convex side), close to the trailing edge of the door (that is to say its edge which trails hindmost along the door's curvature as the door is swung open). The handle is a shaped rib of constant cross section projecting perpendicularly from the door, and is conveniently an extruded plastics material. The handle runs vertically the whole height of the door, so that the door is convenient to open from a large range of heights.

20 A keep and engaging solenoid lock are located in the door edge and door jamb or recess 42 of the column member (which is described below). The solenoid lock is operated by a proximity sensor upon the column member. In use, keys, or other emitting means attached say to a fob or wristband, operating such sensors (for example, by infra-red or ultrasound
25 coded signals) may be kept by the users of the lockers (where the users are to have long term use of the lockers) or may be lent on a short term basis to the users on payment of a deposit (for example, at a gymnasium). The proximity sensor is shielded so as to be protected against vandals or thieves. The solenoid lock and keep is in any case so configured that damage to the
30 proximity sensor will not result in the lock being disengaged.

The solenoid lock and keep may alternatively be situated on the top of the locker, so that a solenoid lock mounted upon upper spaced panel of the locker, whilst the engaging keep is mounted upon the upper hinge

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segment 25. This arrangement is shown in Figure 4 at 34. Naturally, other locking means may be employed to secure the locker.

As shown in figure 1, a number of these lockers 10 are placed side by side in a row, set somewhat apart so that the each locker's door 20 may be accommodated in the space 21 between that locker and the neighbouring locker. A column member 40 is attached to one side of each locker to enclose the space between the lockers and its neighbour. The column member 40 presents a concave curve between a pair of lockers when one is considered as facing the lockers, and includes a vertical recess 42 to accommodate the trailing edge of the door of its own locker, and a gap 43 between itself and the next locker to permit that lockers door to swing past (these features being shown best in figure 3). The column member is of constant cross section.

The two lockers at the either end of the row are provided with column members of slightly different design, one column member requiring only the retaining groove 42 to accept the edge of the door, and the other column member requiring only the curved surface and gap 43 to cover the space occupied by the door in the open position. This space for the open door may be bounded by further panels, that is, a row end panel lying parallel to the lockers' side walls, and a panel extending in the same plane as the lockers' end panels. Alternatively, the lockers could be placed next to one or more walls, the column member for the end locker being attached to the wall.

The column member includes the proximity sensor (not shown) by which the lock may be operated, and also an LED 45 embedded in the concavity of the column member which indicates when the lock is changing its state. The circuitry for the lock and sensor is located in the area bounded by the curved surface of the column member 40, a side wall 12 of one locker, and the curve of the door 20 (when in the closed position) of the neighbouring locker. This space, as well as other unutilised regions, such as the space bounded by the side wall of a locker and the curve of that same lockers door, and the remaining space between two side walls of

neighbouring lockers, may be used to house other components, such as ventilation means (as described below), lighting means and the like.

On the side of the locker corresponding to the space where the open
5 door is retained, the locker side has two excised regions 14 towards the front of the locker, these excised areas opening onto the regions between the locker top's spaced panels 32,33 and the locker bottom's plinth 36 and panel 35. These excised regions allow the top and bottom hinge segments 25,26 to swing over to the side of the locker as the door 20 is opened.

10

Along the back of the row of lockers, rear covering panels are attached to the locker backs, these panels lying in the plane of the lockers' backs, so as to cover the door retaining spaces when viewed facing the lockers' backs. Top covering panels lying in the plane of the lockers' tops
15 similarly cover the door retaining spaces when viewed facing the lockers' tops. The rear covering panels and the panels making up the lockers' back 15 could be replaced by a single, integral panel. Similarly, the top covering panels and the upper panels 32 of the top spaced panels could be replaced by a single, integral panel.

20

It will be seen that in contrast to the lock, keep, and hinge of a prior art locker, the pivoting and locking means of the present locker are largely inaccessible, whether the door is opened or closed, thus cutting down the scope of damage which may be performed by vandals. Furthermore, no
25 leverage can be brought to bear upon the door or the pivoting means.

~~The door of the present locker, in opening to one side of the~~
compartment, allows lockers to be positioned in locations in which a locker having a conventionally pivoted door would be unacceptably cumbersome
30 and restrictive.

Referring now to figure 4, in a modification of the locker the back of the locker 10' comprises two curved members 50,51 and a grating 53, each of which extend through the full height of the locker. The grating is planar
35 rectangular shape, and lies perpendicular to the locker's side walls. Each

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curved member 50,51 includes retaining groove 55 which accepts the thickness of the sides walls so that each side wall 12,13 is joined to a curved member. The two curved members are similarly attached using grooves 56 to either side of the grate 53, securing it in place. The curved members thus, when considered in plan, 'round off' the rear corners of the previous embodiment of the locker 10.

A single, integral, panel 57 is erected to the rear of the row of lockers, so as to shield both the gratings 53 and the door retaining spaces 21'. The gratings 53 provide the lockers 10' with ventilation so that air in an individual locker does not become stale, as might occur for example when the locker is used to store clothes. The ventilation may be enhanced by providing a fan system associated with the row of lockers, the unannotated arrows illustrating such a possible airflow.

Figures 2a and 2b also illustrates various components which may be included in the lockers, such as a grated towel shelf 60, a grated bag shelf 62, a glove box 64, and a coat hook 65. Naturally, many diverse elements or accessories could be included in such a locker.

Many of the parts of the locker may conveniently be extruded, since they have a uniform cross section. As well as the simple planar rectangular top panels 32,33, bottom panel 35, back 15 and walls 12,13 of the locker 10, the door 20, handle 38, column member 40, and curved back portions 51 of the embodiments shown herein could all be extruded, though naturally, they could be manufactured by other techniques.

Various materials could be used, most ideally for extrusion purposes including plastic, glass and aluminium.

The dimensions of the locker will be dependent upon its intended use. For a locker for use in a gymnasium for example, the locker could be between about 250 mm to 400 mm wide, about 600 mm wide, and about 1.8 meters high. Smaller lockers, for example for person effects and stationary for use in schools and offices, or for apartment letter boxes, could be of the

order of 250 mm cubed. Lockers of this size could be stacked one row on top of another.

5 The uniform curve of the door is an optimum shape, in that it allows the column member to be fitted with its edge nearly flush to the door, with only a small gap so that the door does not rub against the column member. It also extends only a short distance perpendicular to the side wall when in the closed position, so minimising the amount of space required between the lockers. Furthermore, the leading edge of the locker and the edge of the
10 corresponding side wall may also be nearly flush, so that if the locker were in use without neighbouring lockers or shielding elements such as the column member, the locker compartment would be completely sealed by the door.

15 Other shapes of door, though not ideal in terms of the above considerations, could be used. Such shapes, considered in plan, would sweep out part of an annular ring, and the edges of the column member and the side wall could only be situated flush with the outer and inner curves of the swept-out shape. Positioning the side wall and column member
20 accordingly, the door could for example be planar, or have a V-shaped cross section.

Having the pivot point in another position would similarly affect the volume swept out by the door, but again, if the side wall and column
25 member were positioned accordingly then the locker would function satisfactorily.

The same principle could also be applied to other types of compartment where a door is required with equal benefit, such as domestic
30 cupboards and office filing cabinets, and even changing rooms and other cubicles.

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CLAIMS

1. A locker or the like including a body forming a compartment having
5 an open side, and a door supported such that said door may be rotated from
a closed position in which the open side of the compartment is substantially
covered by the door, to a open position in which the open side of the
compartment is substantially uncovered, such that in the open position the
door is located substantially alongside the body of the locker.
10
2. A locker or the like according to the previous claim wherein the door
has a curved, generally uniform cross section.
3. A locker or the like according to either previous claim wherein the
15 door has a uniform curvature, and the axis of rotation coincides with the
focus of this curve.
4. A locker or the like according to any previous claim wherein the
door is supported upon pivot means.
20
5. A locker or the like according to any previous claim wherein the
pivot means is supplied by one or more generally segmental shapes pivoted
about the apex of the segmental shape.
- 25 6. A locker or the like according to any previous claim wherein there is
included a locking means to secure the door in the closed position.

7. A locker or the like according to claim 4 wherein the locking means
are of the solenoid type.
30
8. A locker or the like according to either claim 4 or 5 wherein the
locking means act upon the segmental shape.
9. A locker or the like according to any previous claim wherein an
35 extruded handle is provided on the door.

10. A group of lockers according to any previous claim.
- 5 11. A group of lockers according to claim 8 wherein there is provided a cavity between the bodies of at least first and second neighbouring lockers capable of accommodating the door of the first locker whilst it is in the closed position.
- 10 12. A group of lockers according to claim 9 wherein the cavity, when considered from the front of the lockers, is covered by a covering member.
- 15 13. A group of lockers according to claim 10 wherein the covering member includes a recess to accept the one edge of the door of the second locker.
14. A locker or the like substantially as herein described and illustrated.
15. A group of lockers substantially as herein described and illustrated.
- 20 16. Any novel and inventive feature or combination of features specifically disclosed herein within the meaning of Article 4H of the International Convention (Paris Convention).

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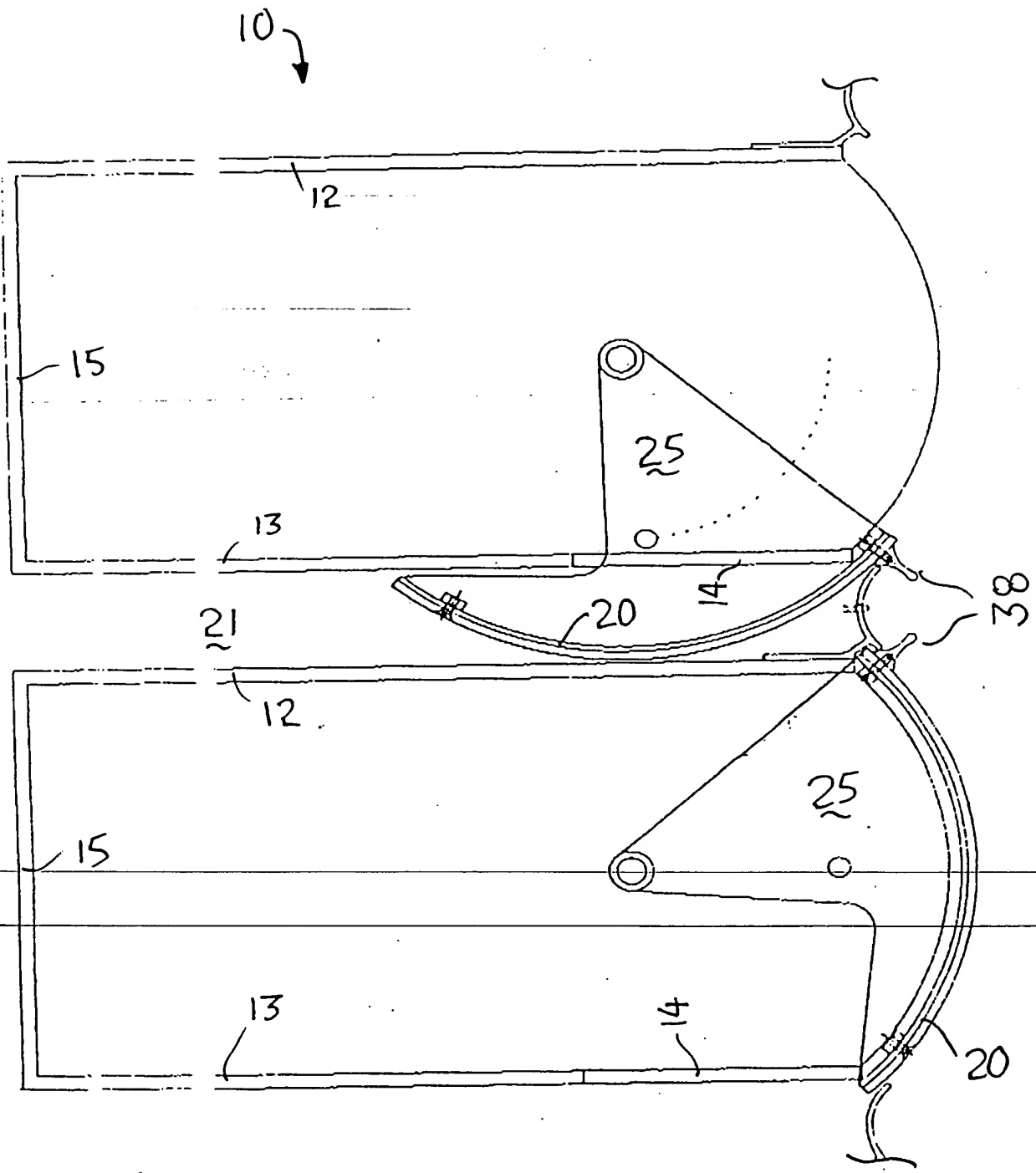
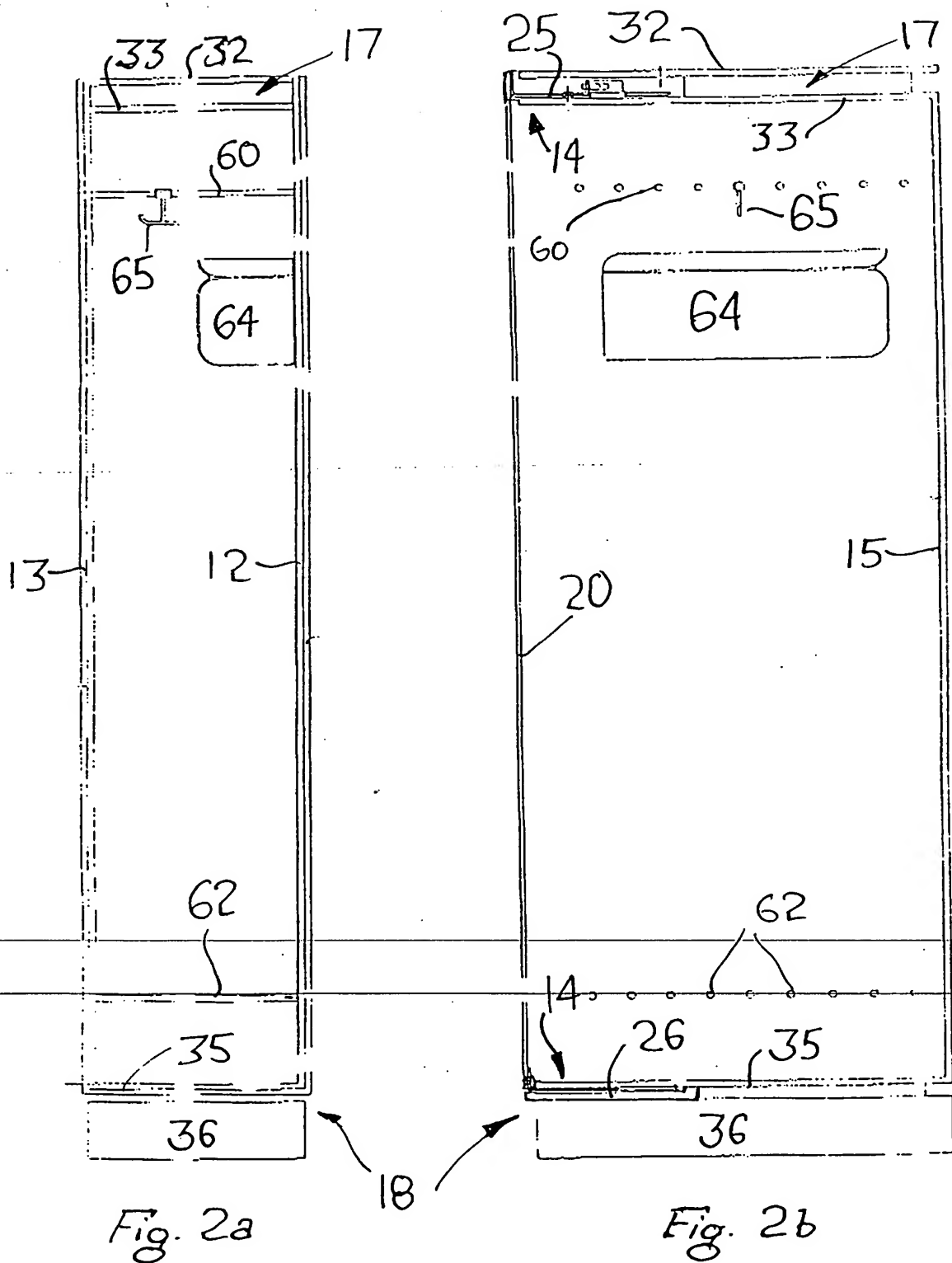


Fig. 1

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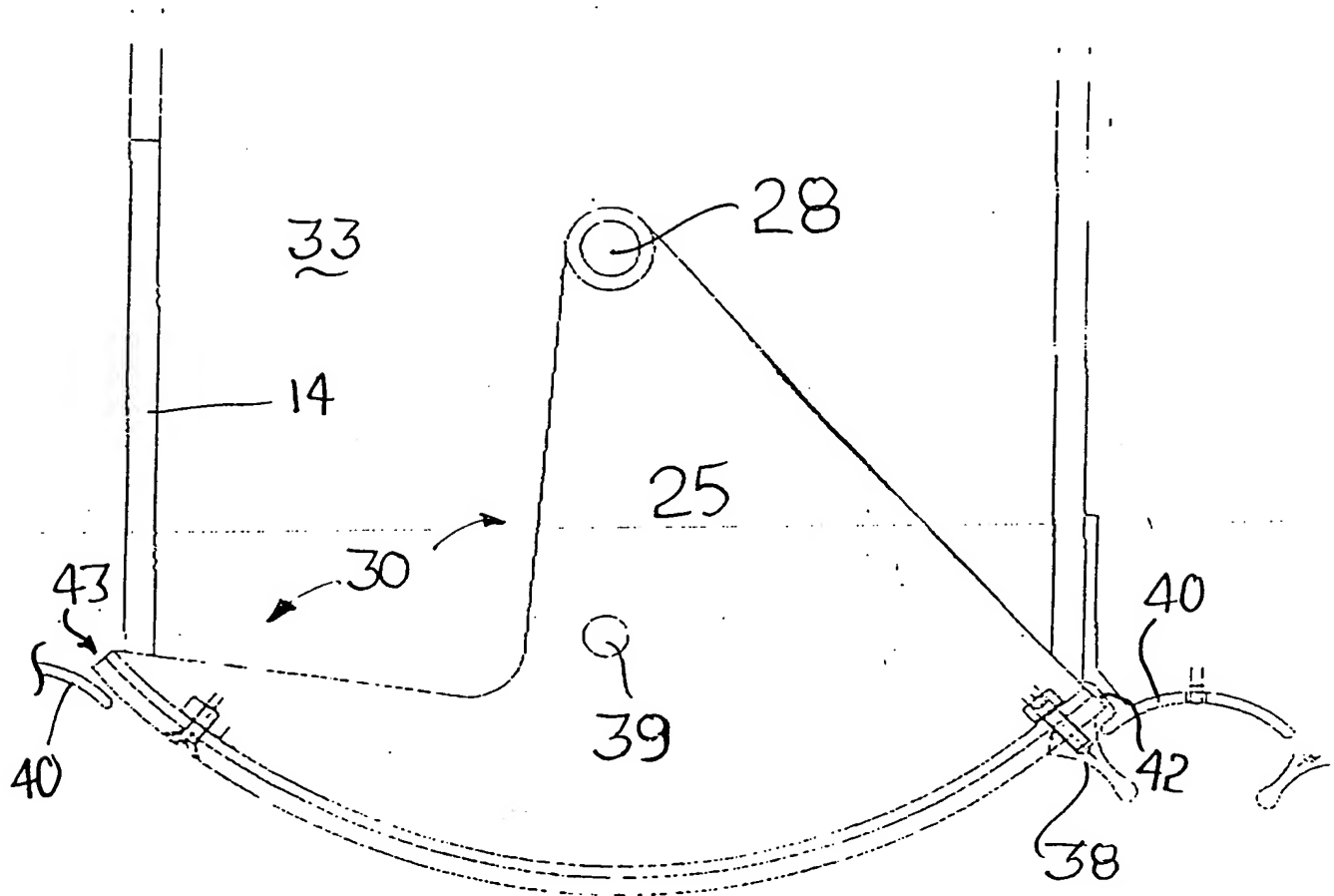


Fig. 3

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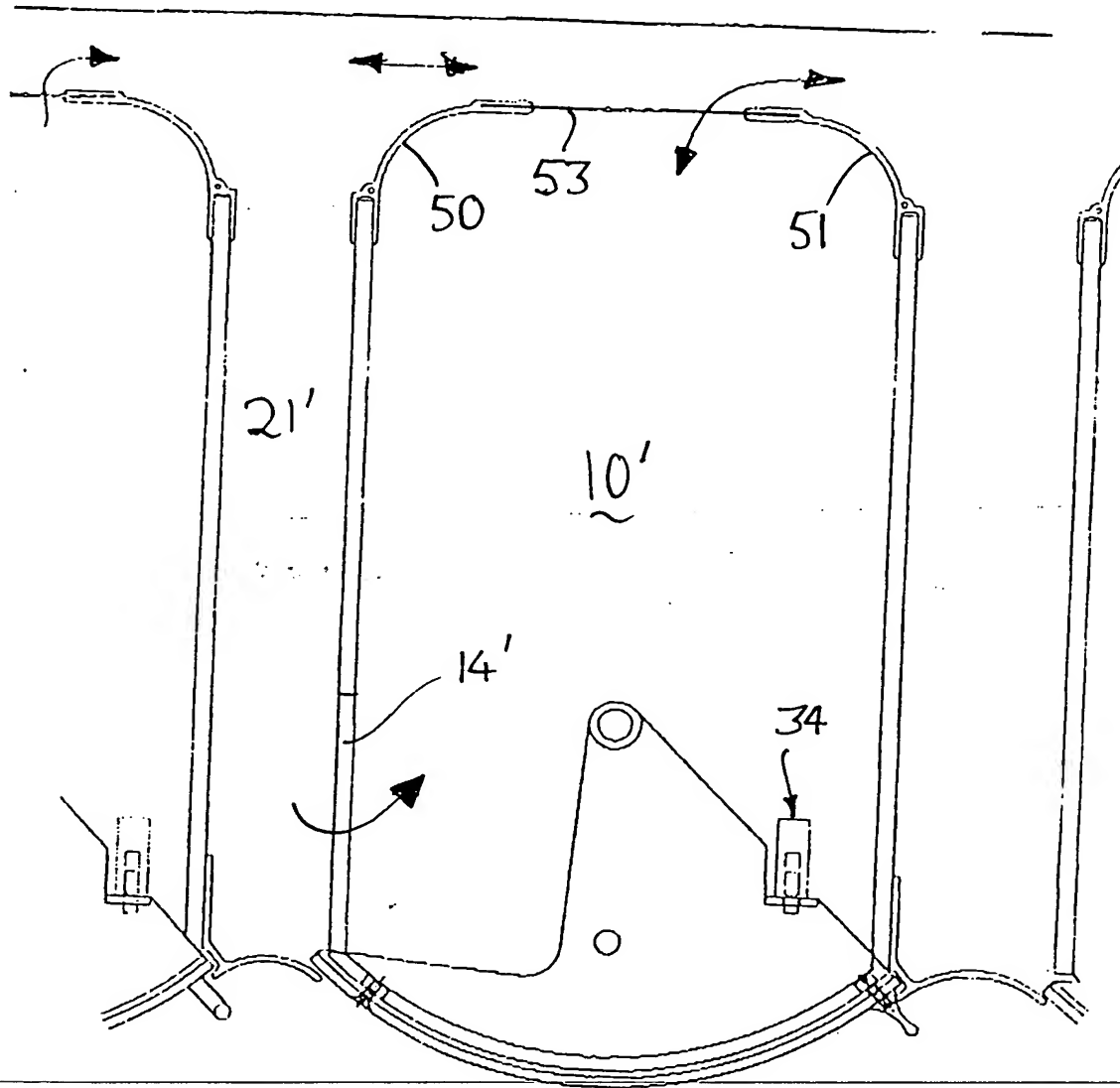


Fig. 4

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